



The Honorable
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Vice Chairman

Outline

- NTSB Basics
- Some Major Accidents
- Some Future Concerns



What the NTSB Does

- Independent agency, investigate transportation accidents, all modes
- Determine probable cause(s) and make recommendations to prevent recurrences
- Conduct special studies and investigations
 - Assist victims and their families



Independent

- 5 Members, nominated by the President, confirmed by the Senate
 - Members are not investigators
 - Safeguards for independence
- Conclusions from facts, not politics



Purpose

- Single focus is *SAFETY*
 - Primary product:
Safety recommendations



Some Major Accidents

- DeHavilland Comet, 1954
- Grand Canyon Collision, 1956
- TWA Flight 514, 1973
- Pan Am Flight 103, 1988
- TWA Flight 800, 1996



BOAC Flight 781

South African Airways Flight 201



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DeHavilland Comet

- First commercial jet airliner
- Higher altitudes than before
- More pressurization than before
- Previous (unpressurized) planes had square corners on windows and doors

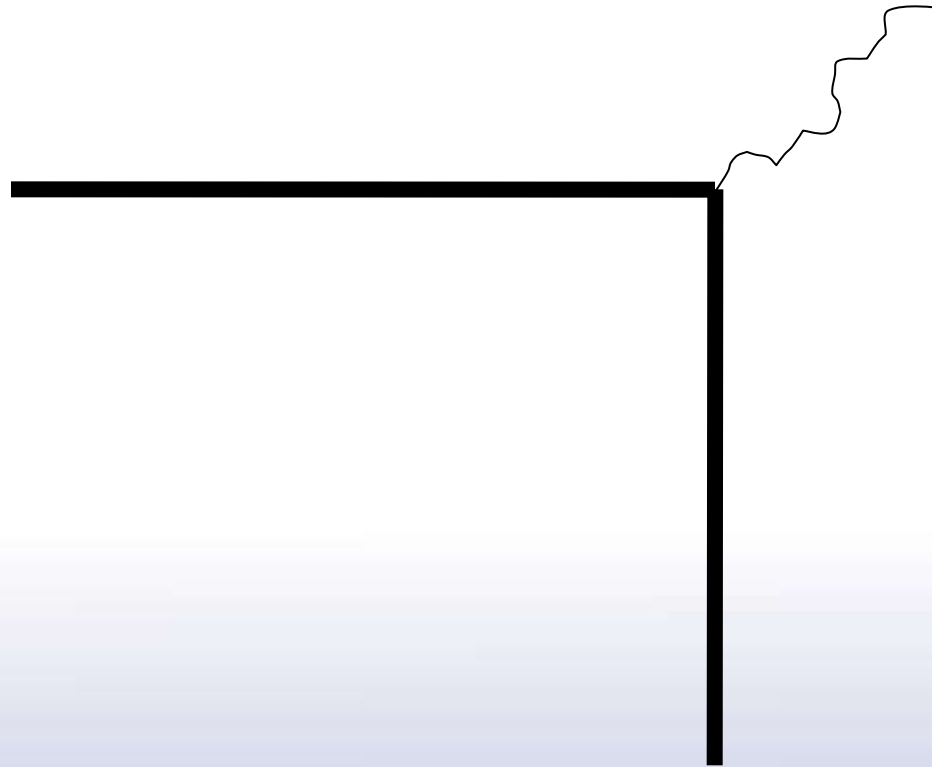


Putting Pieces Together



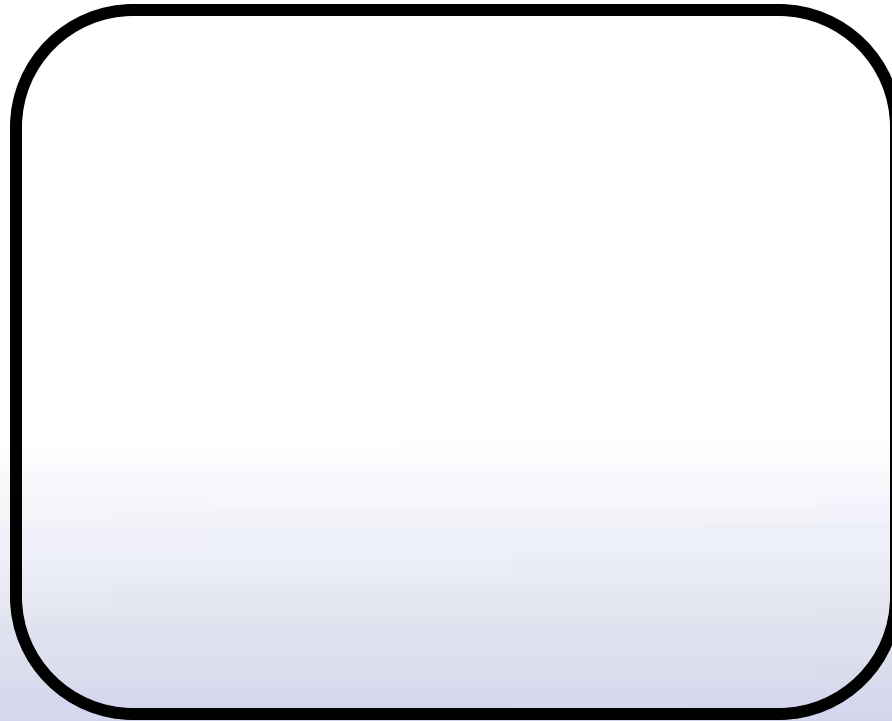
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Extra Stress at Sharp Corners



Remedy

ROUNDED corners on windows and doors



Collision Over Grand Canyon



- Douglas DC-7, Lockheed Constellation
- About 21,000 feet



Outcomes

- Creation of Federal Aviation Administration (FAA) to control air traffic
- Airliners always under “positive control”
 - All aircraft over 18,000 feet under “positive control”



TWA Flight 514

- Controlled Flight Into Terrain (CFIT)
 - Approaching Dulles Airport
- Heavy rain, strong winds from the East
 - Hills in the clouds
- Confusing map (approach chart)
 - No electronic vertical guidance



Strong Wind Over Hill



Outcomes

- Electronic vertical guidance
 - Clarified approach chart
- Warning in cockpit re being too low
- Controllers warned if aircraft too low
 - Aviation Safety Reporting System



Pan Am 103

- Boeing 747
- London to New York
- Bomb in luggage
- Crashed near Lockerbie, Scotland



Lockerbie, Scotland



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Outcomes

- Improved screening of luggage for explosives
- Stronger baggage containers
- Stronger airplanes



TWA 800

- Boeing 747, New York to Paris
- Center (body) fuel tank nearly empty
- Air conditioner below center fuel tank running long time on ground at JFK (July)
 - Fuel + oxygen + spark = ignition
 - Shoulder launched missile?



Outcomes

- Nitrogen (instead of oxygen) to fill empty space in fuel tank
- Improved cooperation of NTSB with criminal authorities



Some Future Concerns

- Pilot professionalism
- Automation complexity
- Criminalization of accidents



Pilot Professionalism

Problem

Loss of military pilot pipeline

Some Recent Examples

- Let's try FL 410! (2004)
- Takeoff without runway lights (2006)
 - Stick shaker: PULL! (2009)
- Minneapolis over-flight (2009)



Automation Complexity

Problems

Complexity – Lack of understanding

Reliability – Never seen that failure before

Recent Examples

- Amsterdam, Holland (2009)
- Air France 447, Rio de Janeiro to Paris (2009)



Criminalization

Problem

Possibility of criminal prosecution chills
flow of proactive safety information

Recent Examples

- Concorde, Paris, France (2000)
- Linate Airport, Milan, Italy (2001)
 - GOL 1907, Brazil (2006)
- Asiana, San Francisco (2013)



Thank You

Questions?



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